TRADE AND INDUSTRIAL EDUCATION

Academic Standards for this area are available at
http://www.doe.in.gov/standards/tradeindustrialed.html

Teacher Requirements for this area are available at
http://doe.in.gov/dps/licensing/assignmentcode

ADVANCED MANUFACTURING

5608 *(ADV MFTG)*
CIP Code: 14.1901

Advanced Manufacturing is a highly specialized course based on the techniques and interrelationships found in high performance manufacturing and production. Instruction should focus on the critical actions, knowledge, systems, and processes necessary to participate in an advanced manufacturing enterprise. Activities should include a focus on *advanced manufacturing processes and production; quality and continuous improvement practices; maintenance awareness; and safety.* Students should additionally develop high performance skills through demonstrations, lectures, self-paced studies, labs, computer simulations, technical presentations, critical thinking, problem solving, and individual / group activities in order to demonstrate the core set of skills and knowledge necessary to prepare for sustained careers in the high performance manufacturing environment.

- Recommended Grade Level: 11-12
- Recommended Prerequisites: Manufacturing Systems, Manufacturing Processes, Technology Enterprises
- Credits: 1 to 3 credits per semester for 2 to 4 semesters
- Counts as a Directed Elective or Elective for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas
- A Career Academic Sequence, Career-Technical program, or Flex Credit course
- Academic content standards: TBD and http://www.msscusa.org/
- Curriculum Framework: See http://www.msscusa.org/
- Teacher Requirements: Technology Education, CTE: Trade and Industrial: Workplace Specialist
- Funding: Additional Pupil Count (APC) vocational funding available when taught by a licensed CTE teacher, Workplace Specialist or (Industrial) Technology Teacher if the teacher has received the appropriate training.

AEROSPACE ENGINEERING TECHNOLOGY

5518 *(AET or AERO TECH)*
CIP Code: 14.0201

Aerospace Engineering Technology provides students with experiences in designing, developing, and evaluating aircraft, space vehicles and their operating systems. Emphasis includes investigation and research on flight characteristics and analysis of aerodynamic design. Classroom instruction provides opportunities for creative thinking and problem-solving activities using appropriate software to design, test, and evaluate a variety of air and space vehicles, their systems, and launching, guidance and control procedures. Daily emphasis is placed on applying mathematical, scientific, and engineering principles.

- Suggested Grade Levels: 11-12
- Recommended prerequisites: Completion of two Project Lead The Way courses
- A two credit course over two semesters
- Counts as a Directed Elective or Elective for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas
- A Career Academic Sequence, Career-Technical program, or Flex Credit course
- State Additional Pupil Count (APC) vocational funding available if taught by appropriate Licensed Teacher http://www.doe.in.gov/octe/pdf/CIPCrosswalk060317.pdf
- Schools involved in Project Lead The Way must use the content standards developed for this pre-engineering program.
- This course is a component of the Science, Engineering and Information Technology career cluster. It may also be included as part of the Transportation, Distribution and Logistics career cluster.

AIRCRAFT OPERATIONS

5524 *(AIRCRFT OP)*
CIP Code: 49.0102

Aircraft Operations provides classroom and practical experiences that prepare individuals to pilot aircraft and assume the eventual command responsibility of carrying passengers and freight. Instruction emphasizes training in aircraft structure, behavior, operation, and controls; radio communications; meteorology; navigation; airway safety and traffic regulations; and, governmental rules and regulations pertaining to piloting aircraft. Completion of this program prepares individuals to take Federal Aviation Administration (FAA) examinations for a commercial pilot's certificate.

- Suggested Grade Levels: 11-12
- Recommended prerequisites: None
- A four to six credit course over two semesters. Schools on block schedules may adjust the total number of credits to meet the local standard.
- The nature of this course allows for a second year of instruction provided that content and standards address higher levels of knowledge.
- Counts as a Directed Elective or Elective for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas
- A Career Academic Sequence, Career-Technical program, or Flex Credit course
- State Additional Pupil Count (APC) vocational funding available if taught by appropriate Licensed Teacher http://www.doe.in.gov/octe/pdf/CIPCrosswalk060317.pdf
- Content standards defined by the Federal Aviation Administration
- This course is a component of the Transportation, Distribution and Logistics career cluster.

APPLIANCE TECHNOLOGY

5504 *(APPLI TECH)*
CIP Code: 47.0106

Appliance Technology includes classroom and laboratory experiences concerned with the theory of electrical circuitry and the maintenance and repair of components used in commercial and consumer appliances. Activities provide students with training in simple gearing, linkages and lubrication used in the operation of appliances such as washers, dryers, water heaters, and

stoves. Related training is provided in the use of familiar tools, test equipment, and service manuals and in making cost estimates for repairs.

- Suggested Grade Levels: 11-12
- Recommended prerequisites: None
- A four to six credit course over two semesters. Schools on block schedules may adjust the total number of credits to meet the local standard.
- The nature of this course allows for a second year of instruction provided that content and standards address higher levels of knowledge.
- Counts as a Directed Elective or Elective for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas
- A Career Academic Sequence, Career-Technical program, or Flex Credit course
- State Additional Pupil Count (APC) vocational funding available if taught by appropriate Licensed Teacher http://www.doe.in.gov/octe/pdf/CIPCrosswalk060317.pdf
- This course is a component of the Mechanical Repair and Precision Crafts career cluster.

AUTOMOTIVE COLLISION REPAIR TECHNOLOGY

5514 *(ACR TECH)*
CIP Code: 47.0603

Automotive Collision Repair Technology includes classroom and laboratory experiences concerned with all phases of the repair of damaged vehicle bodies and frames, including metal straightening; smoothing areas by filing, grinding, or sanding; concealment of imperfections; painting; and replacement of body components including trim. Instruction should also emphasize computerized frame diagnosis, computerized color-mixing, and computerized estimating of repair costs. Additional academic skills taught in this course include precision measurement and mathematical calibrations as well as scientific principles related to adhesive compounds, color-mixing, abrasive materials, metallurgy, and composite materials.

- Suggested Grade Levels: 11-12
- Recommended prerequisites: None
- A four to six credit course over two semesters. Schools on block schedules may adjust the total number of credits to meet the local standard.
- The nature of this course allows for a second year of instruction provided that content and standards address higher levels of knowledge.
- Counts as a Directed Elective or Elective for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas
- A Career Academic Sequence, Career-Technical program, or Flex Credit course
- State Additional Pupil Count (APC) vocational funding available if taught by appropriate Licensed Teacher http://www.doe.in.gov/octe/pdf/CIPCrosswalk060317.pdf
- Content standards exist for this program and reflect the “I-CAR Advance Tech Curriculum.”
- This course is a component of the Mechanical Repair and Precision Crafts career cluster.

AUTOMOTIVE SERVICES TECHNOLOGY

5510 *(AUTO TECH or AST)*
CIP Code: 47.0604

Automotive Services Technology includes classroom and laboratory experiences that incorporate training in service and repair work on all types of automotive vehicles. Included in the course is training in the use of service/repair information and a variety of hand and power tools. Instruction and practice provides opportunities for students to diagnose malfunctions, disassemble units, perform parts inspections, and repair and replace parts. Course content should address NATEF/ ASE standards leading to certification in one or more of the following areas: steering and suspension; brakes; engine performance; manual transmissions and differential; automatic transmissions; electrical systems; air conditioning; and, engine repair. Mathematical skills will be reinforced through precision measuring activities and cost estimation/calculation activities. Scientific principles taught and reinforced in this course include the study of viscosity, friction, thermal expansion, and compound solutions. Written and oral skills will also be emphasized to help students communicate with customers, colleagues, and supervisors.

- Suggested Grade Levels: 11-12
- Recommended prerequisites: None
- A four to six credit course over two semesters. Schools on block schedules may adjust the total number of credits to meet the local standard.
- The nature of this course allows for a second year of instruction provided that content and standards address higher levels of knowledge.
- Counts as a Directed Elective or Elective for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas
- A Career Academic Sequence, Career-Technical program, or Flex Credit course
- State Additional Pupil Count (APC) vocational funding available if taught by appropriate Licensed Teacher http://www.doe.in.gov/octe/pdf/CIPCrosswalk060317.pdf
- Content standards are based NATEF/ASE certifications.
- The National Occupational Competency Testing Institute (NOCTI) exam for this course is titled Automotive Technician Standard. Find the exam blueprint at http://www.nocti.org/PDFs/JobReady/4008_Automotive_Technician_Advanced.pdf
- This course is a component of the Mechanical Repair and Precision Crafts career cluster.

AVIATION MAINTENANCE TECHNOLOGY

5520 *(AVIAT TECH or AMT)*
CIP Code: 47.0607

Aviation Maintenance Technology includes classroom and laboratory experiences concerned with the inspection, repair, servicing, and overhauling of all airplane parts including engines, propellers, instruments, fuel and oil tanks, control cables and hydraulic units. The use of technical manuals and various kinds of testing equipment should be emphasized. Additional instruction should include experiences with air frame maintenance and repair. This training emphasizes layout and fabrication; fitting and structural members; equipment and mechanical parts; and the disassembly and replacement of damaged or worn parts so that students are prepared for the Federal Aviation Administration Examination for the Air Frame Mechanics License.

- Suggested Grade Levels: 11-12
- Recommended Prerequisites: None
- A four to six credit course over two semesters. Schools on block schedules may adjust the total number of credits to meet the local standard.
- The nature of this course allows for a second year of instruction provided that content and standards address higher levels of knowledge.

- Counts as a Directed Elective or Elective for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas
- A Career Academic Sequence, Career-Technical program, or Flex Credit course
- State Additional Pupil Count (APC) vocational funding available if taught by appropriate Licensed Teacher http://www.doe.in.gov/octe/pdf/CIPCrosswalk060317.pdf
- This course is a component of the Mechanical Repair and Precision Crafts career cluster.

AVIATION SUPPORT OPERATIONS

5528 *(AVO)*
CIP Code: 49.0101

Aviation Support Operations includes classroom and practical experiences concerned with the ground support of commercial and general aviation aircraft including passenger service, aircraft preflight service, and flight control. The course provides instruction in security operations, baggage handling, ticket issuing, fueling aircraft, general aircraft maintenance, safety and rescue operations, ground and runway maintenance, air traffic control, and airport office management.

- Suggested Grade Levels: 11-12
- Recommended Prerequisites: None
- A four to six credit course over two semesters. Schools on block schedules may adjust the total number of credits to meet the local standard.
- The nature of this course allows for a second year of instruction provided that content and standards address higher levels of knowledge.
- Counts as a Directed Elective or Elective for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas
- A Career Academic Sequence, Career-Technical program, or Flex Credit course
- State Additional Pupil Count (APC) vocational funding available if taught by appropriate Licensed Teacher http://www.doe.in.gov/octe/pdf/CIPCrosswalk060317.pdf
- This course is a component of the Transportation, Distribution and Logistics career cluster.

BIOTECHNICAL ENGINEERING

5648 *(BIOTECH ENG or BTE)*
CIP Code: 14.0501

This course introduces students to the fundamental aspects of biotechnology and the engineering technologies related to this emerging field. Instruction will emphasize the fusing of engineering and technology with life sciences to create new products. Application and design principles will be used in conjunction with scientific knowledge to explore and investigate such areas as: development of biomedical devices; pharmaceutical and medical therapies; and agricultural research and development. Ethical, social and regulatory issues of biotechnology applications will be addressed through out the course.

- Suggested Grade Levels: 11-12
- Recommended Prerequisites: Completion of two Project Lead The Way courses.
- A two credit course over two semesters.
- Counts as a Directed Elective or Elective for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas
- A Career Academic Sequence, Career-Technical program, or Flex Credit course

- State Additional Pupil Count (APC) vocational funding available if taught by appropriate Licensed Teacher http://www.doe.in.gov/octe/pdf/CIPCrosswalk060317.pdf
- Schools involved in Project Lead The Way must use the content standards developed for this pre-engineering program.
- This course is a component of the Science, Engineering and Information Technology and Health Services career clusters. It may also be included as part of the Manufacturing and Processing career cluster.

BUILDING FACILITIES AND MANAGEMENT

5592 *(BF MGMT)*
CIP Code: 46.0401

Building and Facilities Management is an instructional program that prepares students to service a variety of structures including commercial and institutional buildings. This course provides instruction in basic maintenance and repair skills related to air conditioning, heating, plumbing, electrical, and other mechanical systems. Additional activities should include classroom and laboratory experiences concerned with all phases of the care and cleaning of buildings, fixtures, and furnishings including all types of building interiors such as linoleum, plastic, terrazzo, tile, and wood floors; rugs; and, plastic, wood panel, paint, and synthetic wall coverings. Emphasis should be placed on the use of hand and power tools and selection and use of professional supplies needed for care, repair and maintenance. Students will reinforce their mathematical skills through the practical study of measurement units, ratios, area, and volume calculations. Scientific knowledge will be enhanced through the emphasis on environmental concerns and chemical and electrical safety instruction. Language skills will be strengthened through oral and written work intended to improve students' abilities to communicate with supervisors, colleagues, and clients.

- Suggested Grade Levels: 9-12
- Recommended Prerequisites: None
- A four to six credit course over two semesters. Schools on block schedules may adjust the total number of credits to meet the local standard.
- The nature of this course allows for a second year of instruction provided that content and standards address higher levels of knowledge.
- Counts as a Directed Elective or Elective for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas
- A Career Academic Sequence, Career-Technical program, or Flex Credit course
- State Additional Pupil Count (APC) vocational funding available if taught by appropriate Licensed Teacher http://www.doe.in.gov/octe/pdf/CIPCrosswalk060317.pdf
- This course is a component of the Personal and Commercial Services career cluster.

BUILDING TRADES TECHNOLOGY

5580 *(BT TECH)*
CIP Codes: 46.0201 (Carpenter); 46.0101 (Mason/Tile Setter); 46.0503 (Plumber) 46.0302 (Electrician); 49.0202 (Construction Equipment Operator)

Building Trades Technology includes classroom and laboratory experiences concerned with the erection, installation, maintenance, and repair of buildings, homes, and other structures using assorted materials such as metal, wood, stone, brick, glass, concrete, or composition substances.

Instruction covers a variety of activities such as cost estimating; cutting, fitting, fastening, and finishing various materials; the uses of a variety of hand and power tools; and, blueprint reading and following technical specifications. Knowledge concerning the physical properties of materials should also be emphasized. Instruction in plastering, masonry, tile setting, dry wall installation, plumbing, residential wiring and roofing should be covered in the course of study. Additional areas of instruction can include operation and maintenance of heavy equipment used in the construction industry and processes used for digging, grading, clearing, and excavating. Students will develop accurate and precise measuring skills and an advanced understanding of volume and area calculations as well as the advanced mathematical skills required for construction of rafters, stair stringers, and complex angles. Estimation skills will be strengthened through activities such as ordering of materials and planning construction jobs. Scientific principles will be reinforced through weight load exercises, span length determinations, and the study of relative strength. Reading skills as well as oral and written communication skills will also be emphasized to ensure students' abilities to accurately interpret instructions and provide information to customers and colleagues.

- Suggested Grade Levels: 11-12
- Recommended Prerequisites: None
- A four to six credit course over two semesters. Schools on block schedules may adjust the total number of credits to meet the local standard.
- The nature of this course allows for a second year of instruction provided that content and standards address higher levels of knowledge.
- Counts as a Directed Elective or Elective for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas
- A Career Academic Sequence, Career-Technical program, or Flex Credit course
- State Additional Pupil Count (APC) vocational funding available if taught by appropriate Licensed Teacher http://www.doe.in.gov/octe/pdf/CIPCrosswalk060317.pdf
- The National Occupational Competency Testing Institute (NOCTI) exam for this course is titled Carpentry. Find the exam blueprint at http://www.nocti.org/PDFs/JobReady/3015_Carpentry.pdf
- This course is a component of the Building and Construction career cluster and may also be included as part of the Mechanical Repair and Precision Crafts career cluster.

CABINET AND FURNITURE MANUFACTURING

5888 *(CAB FRN MFTG)*

CIP Codes: 48.0702 (Furniture); 48.0703 (Cabinet Maker/Millworker)

Cabinet and Furniture Manufacturing prepares students in the assembly, production, and finishing of wood-worked products such as kitchen cabinets, windows, frames, molding, trim, and panels and furniture used in commercial and residential settings. Instruction provides training in the use of hand and power tools while emphasizing laying out and shaping stock; mass production and assembling methods; and, marking, binding, sawing, and sanding wood of products. Opportunities to sketch and design cabinets and furniture as well as repair used or damaged wooden articles should be provided to students. Instructional activities integrate the use of precision measuring skills as well as performance of related mathematical calculations needed in the design and manufacturing processes.

- Suggested Grade Levels: 11-12
- Recommended Prerequisites: None
- A four to six credit course over two semesters. Schools on block schedules may adjust the total number of credits to meet the local standard.
- The nature of this course allows for a second year of instruction provided that content

and standards address higher levels of knowledge.
- Counts as a Directed Elective or Elective for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas
- A Career Academic Sequence, Career-Technical program, or Flex Credit course
- State Additional Pupil Count (APC) vocational funding available if taught by appropriate Licensed Teacher http://www.doe.in.gov/octe/pdf/CIPCrosswalk060317.pdf
- This course is a component of the Manufacturing and Processing career cluster.

CIVIL-ARCHITECTURAL ENGINEERING

5650 *(CVLARC ENG or CEA)*
CIP Code: 14.0401

This course introduces students to the fundamental design and development aspects of architectural and civil engineering activities. Application and design principles will be used in conjunction with mathematical and scientific knowledge. Computer software programs will provide students with opportunities to design, simulate, and evaluate the construction of buildings and communities. During the planning and design phases, instructional emphasis should be placed on related Transportation, Distribution and Logistics, water resource, and environmental issues. Activities should include the preparation of cost estimates as well as a review of regulatory procedures that would affect the project design.

- Suggested Grade Levels: 11-12
- Recommended Prerequisites: Completion of two Project Lead The Way courses
- A two credit course over two semesters.
- Counts as a Directed Elective or Elective for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas
- A Career Academic Sequence, Career-Technical program, or Flex Credit course
- State Additional Pupil Count (APC) vocational funding available if taught by appropriate Licensed Teacher http://www.doe.in.gov/octe/pdf/CIPCrosswalk060317.pdf
- Schools involved in Project Lead The Way must use the content standards developed for this pre-engineering program.
- This course is a component of the Science, Engineering and Information Technology career cluster. It may also be included as part of the Building and Construction career cluster.

COMMERCIAL ART AND GRAPHIC DESIGN

5550 *(COM ART DES)*
CIP Code: 50.0402

Commercial Art and Graphic Design includes organized learning experiences that incorporate a variety of visual art techniques as they relate to the design and execution of layouts and illustrations for advertising, displays, promotional materials, and instructional manuals. Instruction also covers advertising theory and preparation of copy, lettering, posters, and artwork in addition to incorporation of photographic images. Communication skills will be emphasized through the study of effective methods used to design commercial products that impart information and ideas. Advanced instruction might also include experiences in silk screening and air brush techniques as well as activities in designing product packaging and commercial displays or exhibits.

- Suggested Grade Levels: 11-12
- Recommended Prerequisites: None

- A four to six credit course over two semesters. Schools on block schedules may adjust the total number of credits to meet the local standard.
- The nature of this course allows for a second year of instruction provided that content and standards address higher levels of knowledge.
- Counts as a Directed Elective or Elective for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas
- A Career Academic Sequence, Career-Technical program, or Flex Credit course
- State Additional Pupil Count (APC) vocational funding available if taught by appropriate Licensed Teacher http://www.doe.in.gov/octe/pdf/CIPCrosswalk060317.pdf
- This course is a component of the Art, Media, and Communications career cluster and may also be included as part of the Manufacturing and Processing and Marketing, Sales, and Promotion career clusters.

COMMERCIAL PHOTOGRAPHY

5570 *(COMM PHOTO)*
CIP Code: 50.0406

Commercial Photography is an organized learning experience that includes theory, laboratory, and studio work as each relates to all phases of camera use and photographic processing. Instruction covers the topics of composition and color dynamics; contact printing and enlarging; developing film; lighting techniques and meters; large and medium format cameras and other current photographic equipment used for portrait, commercial, and industrial photography. Instruction emphasizes the planning, development, and production of materials that visually communicate ideas and information.

- Suggested Grade Levels: 11-12
- Recommended Prerequisites: None
- A four to six credit course over two semesters. Schools on block schedules may adjust the total number of credits to meet the local standard.
- The nature of this course allows for a second year of instruction provided that content and standards address higher levels of knowledge.
- Counts as a Directed Elective or Elective for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas
- A Career Academic Sequence, Career-Technical program, or Flex Credit course
- State Additional Pupil Count (APC) vocational funding available if taught by appropriate Licensed Teacher http://www.doe.in.gov/octe/pdf/CIPCrosswalk060317.pdf
- This course is a component of the Art, Media and Communications and Manufacturing and Processing career clusters.

COMPUTER INTEGRATED MANUFACTURING

5534 *(CIM)*
CIP Code: 14.1901

Computer Integrated Manufacturing is a course that applies mathematical and scientific principles to the manufacturing areas of rapid prototyping, robotics, and automation. Classroom and laboratory instruction will develop problem-solving skills as students use computer controlled rapid prototyping and CNC equipment to construct actual models of their three-dimensional design solutions. Students will evaluate their designs using various techniques of analysis and make appropriate modifications before producing their prototypes. Additional

areas of instruction include an introduction to the fundamentals of robotics and how this equipment is used in an automated manufacturing environment.

- Suggested Grade Level: 11-12
- Recommended Prerequisites: Completion of two Project Lead The Way courses.
- A two to six credit course over two semesters. Schools on block schedules may adjust the total number of credits to meet the local standard.
- The nature of this course allows for a second year of instruction provided that content and standards address higher levels of knowledge.
- Counts as a Directed Elective or Elective for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas
- A Career Academic Sequence, Career-Technical program, or Flex Credit course
- State Additional Pupil Count (APC) vocational funding available if taught by appropriate Licensed Teacher http://www.doe.in.gov/octe/pdf/CIPCrosswalk060317.pdf
- Schools involved in Project Lead The Way must use the content standards developed for this pre-engineering program.
- This course is included as a component of the Engineering, Science, and Technologies career cluster and may also be included as part of the Manufacturing and Processing career cluster.

COMPUTER NETWORK TECHNOLOGY

5532 *(CNT)*
CIP Code: 11.1002

This course prepares students to design, install, maintain, and manage both local and wide area networks. Activities include a combination of classroom instruction, e-learning, and laboratory practice that develops skills in network administration and configurations, problem diagnosis and troubleshooting, system control and maintenance, and upgrades. Additional areas of emphasis should include data backup and system security. Course content should prepare students to successfully complete one or more of industry certification exams in the areas of network installation and management. Extensive course work using technical manuals will reinforce reading comprehension and retention of assigned material. Written and oral exercises will be designed to enhance students' communication skills.

- Suggested Grade Levels: 11-12
- Recommended Prerequisites: None
- A four to six credit course over two semesters. Schools on block schedules may adjust the total number of credits to meet the local standard.
- The nature of this course allows for a second year of instruction provided that content and standards address higher levels of knowledge.
- Counts as a Directed Elective or Elective for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas
- A Career Academic Sequence, Career-Technical program, or Flex Credit course
- State Additional Pupil Count (APC) vocational funding available if taught by appropriate Licensed Teacher http://www.doe.in.gov/octe/pdf/CIPCrosswalk060317.pdf
- This course is a component of the Engineering, Science, and Technologies career cluster.

COMPUTER REPAIR AND MAINTENANCE TECHNOLOGY

5536 *(COMP TECH)*
CIP Code: 47.0104

Computer Repair and Maintenance Technology prepares students to assemble, install, program, operate, maintain, service, and diagnose operational problems in computer systems. The course includes instruction in the underlying physical sciences and supporting mathematics of computer design, installation, construction, and programming operations. The curriculum also includes the study of electrical and electronic circuits and mechanical devices used in computer construction; their combination into systems in individual computers or networked installations; and, the instruments used to detect weaknesses or failure in electrical systems in computers. Course work will require extensive technical reading and the application of information retained from that reading. Language skills will be emphasized to improve students' abilities to efficiently and effectively communicate technical information to customers. Course content standards should prepare students to take industry certification exams in one or more areas of computer repair.

- Suggested Grade Levels: 11-12
- Recommended Prerequisites: Algebra I
- A four to six credit course over two semesters. Schools on block schedules may adjust the total number of credits to meet the local standard.
- The nature of this course allows for a second year of instruction provided that content and standards address higher levels of knowledge
- Counts as a Directed Elective or Elective for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas
- A Career Academic Sequence, Career-Technical program, or Flex Credit course
- State Additional Pupil Count (APC) vocational funding available if taught by appropriate Licensed Teacher http://www.doe.in.gov/octe/pdf/CIPCrosswalk060317.pdf
- Content standards derived from industry certifications have been developed for this course.
- This course is a component of the Engineering, Science, and Technologies and Mechanical Repair and Precision Crafts career clusters.

COSMETOLOGY

5802 *(CSMTLGY)*
CIP Code: 12.0401

Cosmetology includes classroom and practical experiences concerned with a variety of beauty treatments, including the beautification of hair and skin care. Instruction includes training in giving shampoos, rinses, and scalp treatments; hair styling, setting, cutting, dyeing, tinting, bleaching, and fitting wigs; permanent waving; facials; manicuring; and, hand and arm massaging. Scientific knowledge related to bacteriology, anatomy, hygiene, and sanitation will be emphasized. Additional instruction in the areas of small business (salon) management, record keeping, and customer relations should also be provided in this course. Instruction should be designed to qualify students for the licensing examination.

- Suggested Grade Levels: 11-12
- Recommended Prerequisites: None
- Clock hours set by the State Licensing Board
- Counts as a Directed Elective or Elective for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas
- A Career Academic Sequence, Career-Technical program, or Flex Credit course Academic content standards:
- State Additional Pupil Count (APC) vocational funding available if taught by appropriate Licensed Teacher http://www.doe.in.gov/octe/pdf/CIPCrosswalk060317.pdf

- This course is a component of the Personal and Commercial Services career cluster.

DIESEL SERVICE TECHNOLOGY

5620 *(DIESL TECH)*
CIP Code: 47.0605

Diesel Service Technology includes classroom and laboratory experiences concerned with all phases of repair work on diesel engines used to power buses, ships, trucks, railroad trains, electrical generators, construction machinery, and similar equipment. Instruction and practice is provided in the diagnostics and repair of engines, brakes, electrical/electronic systems, suspension and steering. Students will demonstrate performance of these tasks as defined by ASE/NATEF standards. Use of technical manuals, hand and power tools and of testing and diagnostic equipment are also studied in the course. Advanced mathematical skills will be reinforced through precision measuring activities and estimation/calculation exercises. Scientific principles covered in this course include viscosity, friction, thermal expansion, and compound solutions. Written and oral communication skills will also be stressed to improve students' abilities to work with colleagues, customers, and supervisors.

- Suggested Grade Levels: 11-12
- Recommended Prerequisites: None
- A four to six credit course over two semesters. Schools on block schedules may adjust the total number of credits to meet the local standard.
- The nature of this course allows for a second year of instruction provided that content and standards address higher levels of knowledge.
- Counts as a Directed Elective or Elective for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas
- A Career Academic Sequence, Career-Technical program, or Flex Credit course
- State Additional Pupil Count (APC) vocational funding available if taught by appropriate Licensed Teacher http://www.doe.in.gov/octe/pdf/CIPCrosswalk060317.pdf
- Content standards are defined by ASE/NATEF for certified programs.
- This course is a component of the Mechanical Repair and Precision Crafts career cluster and may also be included as part of the Transportation, Distribution and Logistics career cluster.

DIGITAL ELECTRONICS TECHNOLOGY

5538 *(DE or DIG EL TECH)*
CIP Code: 15.0303

Digital Electronics Technology is a course of study in applied digital logic that encompasses the design and application of electronic circuits and devices found in video games, watches, calculators, digital cameras, and thousands of other devices. Instruction includes the application of engineering and scientific principles as well as the use of Boolean algebra to solve design problems. Using computer software that reflects current industry standards, activities should provide opportunities for students to design, construct, test, and analyze simple and complex digital circuitry.

NOTE: The same IDOE course number, 5538, is used for the Project Lead The Way course titled, "Digital Electronics." Schools involved in Project Lead The Way must use the content standards developed for the pre-engineering program.

- Suggested Grade Level: 11-12

- Recommended Prerequisites: Completion of two Project Lead The Way courses
- Credits: A two credit, two semester course. The nature of this course allows for a second year of instruction provided that content and standards address higher levels of knowledge.
- Counts as a Directed Elective or Elective for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas
- A Career Academic Sequence, Career-Technical program, or Flex Credit course
- State Additional Pupil Count (APC) vocational funding available if taught by appropriate Licensed Teacher http://www.doe.in.gov/octe/pdf/CIPCrosswalk060317.pdf
- This course is included as a component of the Engineering, Science, and Technologies career cluster and may also be included as part of the Manufacturing and Processing career cluster.

DRAFTING AND COMPUTER AIDED DESIGN (CAD)

5640 *(DRFT CAD)*
CIP Code: 15.1301

Drafting and Computer Aided Design (CAD) emphasizes the theory and application of drafting principles used to create detailed drawings according to exact project dimensions and specifications. Instruction includes experiences in gathering and translating realistic project data or specifications, completion of two and three dimensional drawings, and the development of computer models. Instruction will reinforce and expand students' mathematical skills through the study of geometric tolerancing and construction and the use of geometry and trigonometry principles in design projects and laboratory activities. Students will also enhance their reading and comprehension skills through daily use of technical software manuals. The techniques learned, and software used, should be state of the art and reflect current industry standards.

- Suggested Grade Levels: 11-12
- Recommended Prerequisites: None
- A four to six credit course over two semesters. Schools on block schedules may adjust the total number of credits to meet the local standard.
- The nature of this course allows for additional years of instruction provided that content and standards address higher levels of knowledge.
- Counts as a Directed Elective or Elective for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas
- A Career Academic Sequence, Career-Technical program, or Flex Credit course
- State Additional Pupil Count (APC) vocational funding available if taught by appropriate Licensed Teacher http://www.doe.in.gov/octe/pdf/CIPCrosswalk060317.pdf
- The National Occupational Competency Testing Institute (NOCTI) exam for this course is titled Architectural Drafting. Find the exam blueprint at http://www.nocti.org/PDFs/JobReady/3004_Arch_Drafting.pdf
- This course is a component of the Engineering, Science, and Technologies career cluster and may also be included as part of the Manufacturing and Processing career cluster.

ELECTRONICS TECHNOLOGY

5684 *(ELECT TECH)*
CIP Code: 47.0101

Electronics Technology is a course that includes classroom and laboratory experiences in wiring and schematic diagrams used to design, install, and repair electrical/electronic equipment such

as wireless communication devices, programmable controllers, consumer electronic products, amplifiers, computers, and related equipment. Course content will include basic theories of electricity, electronics, digital technology, and basic circuit analysis. Activities include experiences in: soldering; use of an oscilloscope, meters, signal generators and tracers; bread-boarding; circuit simulation software; and troubleshooting. Understanding and using the underlying scientific principles related to electricity, electronics, circuits, sine waves, and Ohm's Law are integral to this course. Students will use mathematical principles to solve electronic problems and to troubleshoot electrical circuits. Emphasis will be placed on the ability to read, comprehend, and use information found in technical manuals.

- Suggested Grade Levels: 11-12
- Recommended Prerequisites: None
- A four to six credit course over two semesters. Schools on block schedules may adjust the total number of credits to meet the local standard.
- The nature of this course allows for additional years of instruction provided that content and standards address higher levels of knowledge.
- Counts as a Directed Elective or Elective for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas
- A Career Academic Sequence, Career-Technical program, or Flex Credit course
- State Additional Pupil Count (APC) vocational funding available if taught by appropriate Licensed Teacher http://www.doe.in.gov/octe/pdf/CIPCrosswalk060317.pdf
- This course is a component of the Science, Engineering and Information Technology career cluster and may also be included as a component of the Manufacturing and Processing; Mechanical Repair and Precision Crafts; and, Building and Construction career clusters.

ENGINEERING

5644 *(ENGNR)*
CIP Code: 14.9999

Engineering introduces students to the fundamental aspects of engineering and engineering technology. Instruction will emphasize underlying principles of engineering processes and the development of three-dimensional solid models. Instructional activities will build skills ranging from sketching simple geometric shapes to applying a solid modeling computer software package. Students will develop critical thinking and problem-solving skills through instructional activities that pose design and application challenges for which they develop solutions. The techniques learned, and equipment used, should be state of the art and reflect equipment and processes currently being used by engineers throughout the United States.

NOTE: Schools with a signed agreement with the national Project Lead The Way (PLTW) organization may use this title to offer the following PLTW courses over a two year period: Principles of Engineering, Introduction to Engineering Design, and Engineering Design and Development which all have the same IDOE course number 5644.

- Suggested Grade Levels: 9 -12
- Recommended Prerequisites: None
- Credits: A two credit, two semester course. The nature of this course allows for a second year of instruction provided that content and standards address higher levels of knowledge.
- Counts as a Directed Elective or Elective for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas
- A Career Academic Sequence, Career-Technical program, or Flex Credit course.

- State Additional Pupil Count (APC) vocational funding available if taught by appropriate Licensed Teacher http://www.doe.in.gov/octe/pdf/CIPCrosswalk060317.pdf
- Schools involved in Project Lead The Way must use the content standards developed for the pre-engineering program.
- This course is a component of the Engineering, Science, and Technologies career cluster and may also be included as part of the Building and Construction and Manufacturing and Processing career clusters.

FIRE SCIENCE

5820 *(FIRE SCI)*
CIP Code: 43.0203

Fire Science training includes instruction in the chemistry of fire; the use of water and other materials in fighting fires; the various kinds of fire fighting equipment such as extinguishers, pumps, hoses, ropes, ladders, gas masks, hydrants, and standpipe and sprinkler systems; methods of entry; rescue principles, practices, and equipment; salvage practices and equipment; fire and arson investigation; and, inspection techniques. Additional training in chemical and radiation hazards and methods designed to ensure community safety and effective clean-ups can be incorporated in this area. Suggested Grade Levels: 11-12

- Recommended Prerequisites: None
- A four to six credit course over two semesters. Schools on block schedules may adjust the total number of credits to meet the local standard.
- The nature of this course allows for a second year of instruction provided that content and standards address higher levels of knowledge.
- Programs may provide instruction that concentrates in one protective service occupation or may sequence training in several career areas over a two-year period.
- Counts as a Directed Elective or Elective for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas
- A Career Academic Sequence, Career-Technical program, or Flex Credit course.
- State Additional Pupil Count (APC) vocational funding available if taught by appropriate Licensed Teacher http://www.doe.in.gov/octe/pdf/CIPCrosswalk060317.pdf
- This course is a component of the Law, Public Safety and Security career cluster.

GRAPHIC IMAGING TECHNOLOGY

5572 *(GRAPH TECH)*
CIP Code: 10.0305

Graphic Imaging Technology will include organized learning experiences that focus on theory and laboratory activities in pre-press, press and finishing operations. Emphasis will be placed on elements of design and layout leading to computerized electronic image generation, plate preparation, pressroom operations, and finishing techniques. Instructional activities will enhance student's language arts skills through the use of proofreading, spelling, and punctuation exercises. The course will include actual production processes in conjunction with classroom assignments embracing the technologies of printing, publishing, packaging, electronic imaging, and their allied industries.

- Suggested Grade Levels: 11-12
- Recommended Prerequisites: None
- A four to six credit course over two semesters. Schools on block schedules may adjust the total number of credits to meet the local standard.

- The nature of this course allows for a second year of instruction provided that content and standards address higher levels of knowledge.
- Counts as a Directed Elective or Elective for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas
- A Career Academic Sequence, Career-Technical program, or Flex Credit course.
- State Additional Pupil Count (APC) vocational funding available if taught by appropriate Licensed Teacher http://www.doe.in.gov/octe/pdf/CIPCrosswalk060317.pdf
- Students may demonstrate proficiency and earn certification(s) through the PrintED certification program operated by the Graphic Arts Education and Research Foundation (GAERF) and/or also earn an Indiana Certificate of Technical Achievement.
- This course is a component of the Art, Media, and Communication and Manufacturing and Processing career clusters.

HEATING, VENTILATION, AIR CONDITIONING, AND REFRIGERATION

5496 *(HVACR)*
CIP Code: 47.0201

This course provides students with classroom and laboratory experiences concerned with heat generation, ventilation, air conditioning and cooling/refrigeration systems. Instruction emphasizes proficiency in the design, development, testing and installation of the various systems with learning experiences focused on the operation and trouble-shooting of equipment, including the controls needed for residential and commercial use. Course content also includes instruction in blueprint reading, the use of technical reference manuals, the diagnosis and repair of malfunctions, and the use of hand tools and machines to fabricate sheet metal items made of steel, copper, stainless steel, and aluminum. Daily emphasis will be placed on students' abilities to calculate area, volume, air flow, and resistance. Estimation and algebra skills as well as scientific principles related to gases, liquids, and other materials will be reinforced through laboratory activities.

- Suggested Grade Levels: 11-12
- Recommended Prerequisites: None
- A four to six credit course over two semesters. Schools on block schedules may adjust the total number of credits to meet the local standard.
- The nature of this course allows for a second year of instruction provided that content and standards address higher levels of knowledge.
- Counts as a Directed Elective or Elective for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas
- A Career Academic Sequence, Career-Technical program, or Flex Credit course.
- State Additional Pupil Count (APC) vocational funding available if taught by appropriate Licensed Teacher http://www.doe.in.gov/octe/pdf/CIPCrosswalk060317.pdf
- This course is a component of the Mechanical Repair and Precision Crafts and Building and Construction career clusters and may also be included as a component of the Science, Engineering and Information Technology career cluster.

HOME TECHNOLOGY INTEGRATION

5688 *(HOME TECH)*
CIP Code: 46.0302

Home Technology Integration is a highly specialized course focused on applying the skills and knowledge associated with residential wiring and principles of electricity/electronics to install

and connect technologies into a user friendly, functional environment. Activities should include a focus on low and high voltage wiring, systems integration, telecommunications standards, and exposure to a range of residential technologies including: home computer networks; audio/ video systems; home security and surveillance systems; home lighting control; HVAC management; and water system and home access controls. Instructional strategies should include demonstrations, lectures, self-paced studies, hands-on labs, computer simulations, and technical presentations. Students completing this course should be prepared for the HTI+ Certification exams required by many employers hiring for this specialty area.

- Recommended Grade Levels: 11 & 12
- Recommended Prerequisites: Construction Systems, Construction Processes, or Communication Systems, Communication Processes
- One to three credits per semester, one or two years
- Counts as a Directed Elective or Elective for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas
- A Career Academic Sequence, Career-Technical program, or Flex Credit course
- Counts toward the 8-10 Career-Technical credits required for Core 40 withTechnical Honors
- Academic content standards: TBD but based on the certification program
- Curriculum Framework: TBD but following content required for each of the 3 certification areas.
- This course generates state vocational funding (APC) for schools with approved CTE programs

INDUSTRIAL REPAIR AND MAINTENANCE

5686 *(REP-MAINT)*
CIP Code: 47.0303

Industrial Repair and Maintenance includes classroom and practical experiences that prepare students to apply technical knowledge and skills to repair and maintain industrial machinery and equipment. Instructional activities develop diagnostic and problem-solving skills related to electric circuits, wiring, motors, robotics, hydraulics, and pneumatics. Additional areas of instruction should include plumbing, rigging, basic machining, and welding and cutting.

- Suggested Grade Levels: 11-12
- Recommended Prerequisites: None
- A four to six credit course over two semesters. Schools on block schedules may adjust the total number of credits to meet the local standard.
- The nature of this course allows for a second year of instruction provided that content and standards address higher levels of knowledge.
- Counts as a Directed Elective or Elective for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas
- A Career Academic Sequence, Career-Technical program, or Flex Credit course.
- State Additional Pupil Count (APC) vocational funding available if taught by appropriate Licensed Teacher http://www.doe.in.gov/octe/pdf/CIPCrosswalk060317.pdf
- This course is a component of the Mechanical Repair and Precision Crafts career cluster.

INTEGRATED ELECTRONIC TECHNOLOGIES

5690 *(INT EL TECH)*
CIP Code: 46.0302

Integrated Electronic Technologies is a course of study based on the scientific principles of electricity and the basic theories of electronics, basic circuit analysis, and digital technologies. Activities should focus on consumer electronic products and the skills needed to install, maintain, and trouble shoot hardware and software acquisitions. Students should also participate in activities that build customer relations and interpersonal skills for possible employment in the following areas: technical help desks and call centers; retail sales; consumer education; and repair service. Emphasis will be placed on the ability to read, comprehend, and use information found in technical manuals. Students completing this course of study should be prepared for an industry exam in electronics or a specialty area associated with consumer products.

- One to three credits per semester, one or two years
- Recommended Grade Levels: 11 & 12
- Recommended Prerequisite: Digital Electronics
- A four to six credit course over two semesters.
- Counts as a Directed Elective or Elective for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas
- A Career Academic Sequence, Career-Technical program, or Flex Credit course
- Counts toward the 8-10 Career-Technical credits required for Core 40 with Technical Honors
- This course generates state vocational funding (APC) for schools with approved

LAW ENFORCEMENT

5822 *(LAW ENFORC)*
CIP Code: 43.0107

Law Enforcement includes specialized classroom and practical experiences related to public safety occupations such as law enforcement, loss protection services, and homeland security. Training is based on standards and content similar to that provided by officially designated law enforcement agencies. Instruction includes procedures for patrolling on foot or in an automobile during the day or at night; dealing with misdemeanors, felonies, traffic violations, and accidents; investigative and evidence collection procedures; making arrests; and testifying in court. Students will have opportunities to use mathematical skills in crash reconstruction and analysis activities requiring measurements and performance of speed/acceleration calculations. Additional activities simulating criminal investigations will be used to teach scientific knowledge related to anatomy, biology, and chemistry. Oral and written communication skills should be reinforced through activities that model public relations and crime prevention efforts as well as the preparation of police reports.

- Suggested Grade Levels: 11-12
- Recommended Prerequisites: None
- A four to six credit course over two semesters. Schools on block schedules may adjust the total number of credits to meet the local standard.
- The nature of this course allows for a second year of instruction provided that content and standards address higher levels of knowledge.
- Programs may provide instruction that concentrates in one protective service occupation or may sequence training in several career areas over a two-year period.
- Counts as a Directed Elective or Elective for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas
- A Career Academic Sequence, Career-Technical program, or Flex Credit course.

- State Additional Pupil Count (APC) vocational funding available if taught by appropriate Licensed Teacher http://www.doe.in.gov/octe/pdf/CIPCrosswalk060317.pdf
- This course is a component of the Law, Public Safety and Security career cluster.

MOBILE ELECTRONICS

5692 *(MOBL ELECT)*
CIP Code: 46.0302

Mobile Electronics is a highly specialized course that focuses on vehicle electrical systems and installation techniques for a range of products that are in demand by consumers. Activities will focus on: charging and electrical systems; locating, testing and documenting wiring; advanced audio system installation; basic security installation; remote start installation; and navigation systems. Additional areas of study should include acoustical principles, series and parallel circuits, and wireless communications. Students should have opportunities to use hands-on labs, self-paced and facilitator instructed modules, and simulations that build skills in trouble shooting common problems. Students completing this course should be prepared for the Mobile Electronics Certified Professional exams valued by employers hiring for this specialty area. Additional levels of certification can be achieved by students continuing their education in a postsecondary technical program or on-the-job training programs.

- Recommended Grade Levels: 11 & 12
- Recommended Prerequisite: At least one semester of Auto Service Technology
- One to three credits per semester, one or two years
- Counts as a Directed Elective or Elective for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas
- A Career Academic Sequence, Career-Technical program, or Flex Credit course
- Counts toward the 8-10 Career-Technical credits required for Core 40 with Technical Honors
- Academic content standards: Based on the instructional areas required for certification
- Curriculum Framework: Driven by the content needed for the “apprentice level” certification
- This course generates state vocational funding (APC) for schools with approved CTE programs

PLASTICS TECHNOLOGY

5810 *(PLAST TECH)*
CIP Code: 15.0607

Plastics Technology includes classroom and laboratory experiences dealing with the properties and characteristics of plastics and polymers. Activities include bench molding, fitting, internal carving, and finishing plastics and fiberglass materials into products. Instruction trains students in the use of hand and power tools as well as the manufacturing processes and equipment that reflect current industry practices.

- Suggested Grade Levels: 11-12
- Recommended Prerequisites: None
- A four to six credit course over two semesters. Schools on block schedules may adjust the total number of credits to meet the local standard.
- The nature of this course allows for a second year of instruction provided that content and standards address higher levels of knowledge.
- Counts as a Directed Elective or Elective for the General, Core 40, Core 40 with

Academic Honors and Core 40 with Technical Honors diplomas
- A Career Academic Sequence, Career-Technical program, or Flex Credit course.
- State Additional Pupil Count (APC) vocational funding available if taught by appropriate Licensed Teacher http://www.doe.in.gov/octe/pdf/CIPCrosswalk060317.pdf
- This course is a component of the Manufacturing and Processing and Engineering, Science, and Technologies career clusters.

PRECISION MACHINE TECHNOLOGY

5782 *(MACH TECH)*
CIP Code: 48.0501

Precision Machine Technology includes a wide range of classroom and laboratory experiences that develop skills and knowledge in the shaping of metal parts. Emphasis is placed on basic precision machining operations including the use of lathes, drill presses, and grinders, in addition to mill and bench work. Instruction includes the use and care of other precision tools such as micrometers, indicators, combination squares, scales, and calipers. Advanced instruction should include preparation in the use of Computer Numerically Controlled (CNC) machines that reflect current industry practices. Application of mathematical skills and blue print reading is part of the daily experience. Technical reading and writing skills will also be emphasized.

- Suggested Grade Levels: 11-12
- Recommended Prerequisites: Algebra and Geometry
- A four to six credit course over two semesters. Schools on block schedules may adjust the total number of credits to meet the local standard.
- The nature of this course allows for a second year of instruction provided that content and standards address higher levels of knowledge.
- Counts as a Directed Elective or Elective for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas
- A Career Academic Sequence, Career-Technical program, or Flex Credit course.
- State Additional Pupil Count (APC) vocational funding available if taught by appropriate Licensed Teacher http://www.doe.in.gov/octe/pdf/CIPCrosswalk060317.pdf
- The National Occupational Competency Testing Institute (NOCTI) exam for this course is titled Precision Machining. Find the exam blueprint at http://www.nocti.org/PDFs/JobReady/3052_Precision_Machining.pdf
- This course is a component of the Manufacturing and Processing career cluster.

RECREATIONAL AND PORTABLE POWER EQUIPMENT

5842 *(RPPE)*
CIP Codes: 47.0606 (Small Engine Repair); 47.0611 (Motorcycle Repair); 47.0616 (Marine Maintenance)

This course provides opportunities for in-depth study about a variety of recreational and portable power units. Classroom and laboratory experiences are based on activities that build skills and knowledge in the fundamentals of electricity, hydraulics, water and air cooled systems, engine electrical systems, compression ignitions, starting systems, fuel and lubrication systems as well as carburetors and drive systems. Training begins with instruction on repair and routine service of portable power equipment such as lawn mowers, chain saws and other outdoor grounds maintenance equipment. Instruction emphasizes current environmental regulations regarding both noise and air pollution standards. Advanced training should cover care and service of

recreational vehicles including motorcycles, mini-bikes, snowmobiles, all-terrain vehicles (atvs), and outboard motors. Daily emphasis is placed on reading technical manuals and using oral communications skills in a customer service setting.

- Suggested Grade Levels: 11-12
- Recommended Prerequisites: None
- A four to six credit course over two semesters. Schools on block schedules may adjust the total number of credits to meet the local standard.
- The nature of this course allows for a second year of instruction provided that content and standards address higher levels of knowledge.
- Counts as a Directed Elective or Elective for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas
- A Career Academic Sequence, Career-Technical program, or Flex Credit course.
- State Additional Pupil Count (APC) vocational funding available if taught by appropriate Licensed Teacher http://www.doe.in.gov/octe/pdf/CIPCrosswalk060317.pdf
- This course is a component of the Mechanical Repair and Precision Crafts career cluster.

3D COMPUTER ANIMATION AND VISUALIZATION

5530 *(3D CMP ANIM)*
CIP Code: 10.0304

3D Computer Animation and Visualization prepares students to use computer applications and related visual and sound imaging techniques to create and manipulate images and information. The course includes instruction in three-dimensional solid model creation, sketching, and storyboarding, time and motion study, color and lighting studies, and camera positioning. Using current computer animation software that reflects industry standards, students should produce projects for commercial applications in one or more of the following areas: engineering, architectural, or industrial design; marketing; video production; internet design; electronic gaming; and, education and training.

- Suggested Grade Levels: 11-12
- Recommended Prerequisites: None
- A four to six credit course over two semesters. Schools on block schedules may adjust the total number of credits to meet the local standard.
- The nature of this course allows for a second year of instruction provided that content and standards address higher levels of knowledge.
- Counts as a Directed Elective or Elective for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas
- A Career Academic Sequence, Career-Technical program, or Flex Credit course
- State Additional Pupil Count (APC) vocational funding available if taught by appropriate Licensed Teacher http://www.doe.in.gov/octe/pdf/CIPCrosswalk060317.pdf
- This course is a component of the Art, Media, and Communications career cluster.

TRACTOR/TRAILER OPERATION

5622 *(TRACTOR OP)*
CIP Code: 49.0205

This course is designed as a comprehensive training program that prepares students to enter the trucking industry as an entry-level tractor-trailer operator. Instruction will include both classroom activities and behind-the-wheel driving experiences. Additional emphasis will include

preventive maintenance and basic control skills training. Students are required to submit to and pass a Department of Transportation, Distribution and Logistics physical exam and drug screen. In addition, students must reach their 18th birthday prior to graduation from high school in order to enroll in and complete this course. Upon successful completion, students will be qualified to operate Class A Commercial Vehicles on Indiana highways.

- Suggested Grade Levels: 12
- Recommended Prerequisites: None
- A three credit course over one semester.
- Counts as a Directed Elective or Elective for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas
- A Career Academic Sequence, Career-Technical program, or Flex Credit course.
- State Additional Pupil Count (APC) vocational funding available if taught by appropriate Licensed Teacher http://www.doe.in.gov/octe/pdf/CIPCrosswalk060317.pdf
- This course is a component of the Transportation, Distribution and Logistics career cluster.

WELDING TECHNOLOGY

5776 *(WELD TECH)*
CIP Code: 48.0508

Welding Technology includes classroom and laboratory experiences that develop a variety of skills detailed in American Welding Society (AWS) Entry Level Guidelines and Certifications. Areas of study include electric welding and flame and plasma cutting. Instructional activities emphasize properties of metals, safety issues, blueprint reading, electrical principles, welding symbols, and mechanical drawing through projects and exercises that teach students how to weld industrial metals in four basic welding positions. Reinforcement of mathematical skills in geometry, precision measurement, and estimation will be part of the daily instruction. Understanding the principles of metallurgy, gases, and materials science is integral to this course.

- Suggested Grade Levels: 11-12
- Recommended Prerequisites: None
- A four to six credit course over two semesters. Schools on block schedules may adjust the total number of credits to meet the local standard.
- The nature of this course allows for a second year of instruction provided that content and standards address higher levels of knowledge.
- Counts as a Directed Elective or Elective for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas
- A Career Academic Sequence, Career-Technical program, or Flex Credit course.
- State Additional Pupil Count (APC) vocational funding available if taught by appropriate Licensed Teacher http://www.doe.in.gov/octe/pdf/CIPCrosswalk060317.pdf
- Students may demonstrate proficiency and earn certification(s) through AWS.
- This course is a component of the Manufacturing and Processing career cluster.